

PROFILE OF STUDENT REPRESENTATION OF ELECTRICAL ENGINEERING AT PHYSICS LECTURE

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Abstract

Representation is very important used in electrical engineering students in physics lectures. Representation consists of verbal, mathematics, diagrams, and graphs. This research uses case study method in electrical engineering students who are physics lectures. Data were collected using questionnaires, observations sheet, and interview guidelines. Based on the questionnaire, the results of the teaching materials used are not yet complete using multi representation, the lecture model does not use multi representation, and the problem is used more using verbal and mathematic representation. Electrical engineering courses are required by using multi representation.

Keywords: *Student, Representation, Electrical Engineering, Physics Lecture*

Introduction

Education continues to develop. Education is an aspect of improving Indonesia's competitiveness from ASEAN countries. Science education has a role as a tool to help electrical engineering students break the problems of everyday life. Electrical engineering students should also.

The result of the research shows that 75% of the students in electrical engineering gets C and 25% student gets C. This result shows that students have difficulty in physics course. This result needs to be done in lecturing process.

Representation is very important for use in student techniques [1]. Representations can help students in the problem-solving process [2]. Representation is an important part of science [3]. Representations can be distinguished into verbal, mathematical, image, and graphical representations [4]. Use of representation is used to minimize student relationships in physics learning [5]. Teaching by involving multiple

representations provides a rich context for students to understand a concept [6].

Based on previous research shows that representation is important in learning. Therefore, it is necessary to use representation in the lecture to solve the problem. The formulation of the problem in this research is how the representation profile of electrical engineering students at one of the universities in Lampung?.

Research Methodology

This research is a descriptive research with case study method. The subject of this research is electro engineering student of academic year 2015/2016. Data collection techniques used in questionnaire (consist of 10 questions), observation, and interview.

Results And Discussion

Based on the results of questionnaires, observations, and interviews obtained the results and discussion as follows

A. Questionnaire results data

Questionnaire consists of 10 questions to reveal the use of

representation in lecturing process (Table 1). The result of data analysis is shown in Figure 1. Figure 1 shows that.

Table 1. Result of student questionnaire

No	Questions	STS	TS	S	SS
		dalam (%)			
1	Teaching materials made by the lecturers themselves using representations in explaining the concept of physics and easy to understand ?,		75	25	
2	Lecturers present lectures using multi representations: images, graphics, mathematical, and verbal ?,		75	25	
3	Students find it difficult to represent basic physical concepts into image representations?			25	75
4	Students find it difficult to represent basic physical concepts into mathematical representations ?,		50	25	25
5	Students find it difficult to represent basic physical concepts into graphical representations?				100
6	Students find it difficult to represent basic physical concepts into verbal representations?		75	25	
7	Students find it easier to understand the basic Physics concept if the lecturer explains by representing the basic Physics concept in the picture or graph?		50	50	
8	Students find it easier to understand the basic physics concept if the lecturer explains by representing the basic physics concept with verbal or mathematical?			75	25
9	Lecturers provide tasks that demand the ability of students to use the ability of image representation, mathematical, verbal, and graphics?		75	25	
10	The exam questions given by lecturers require students to use the ability to represent images, mathematical, verbal, and graphics?		75	25	

Graphically like picture 1.

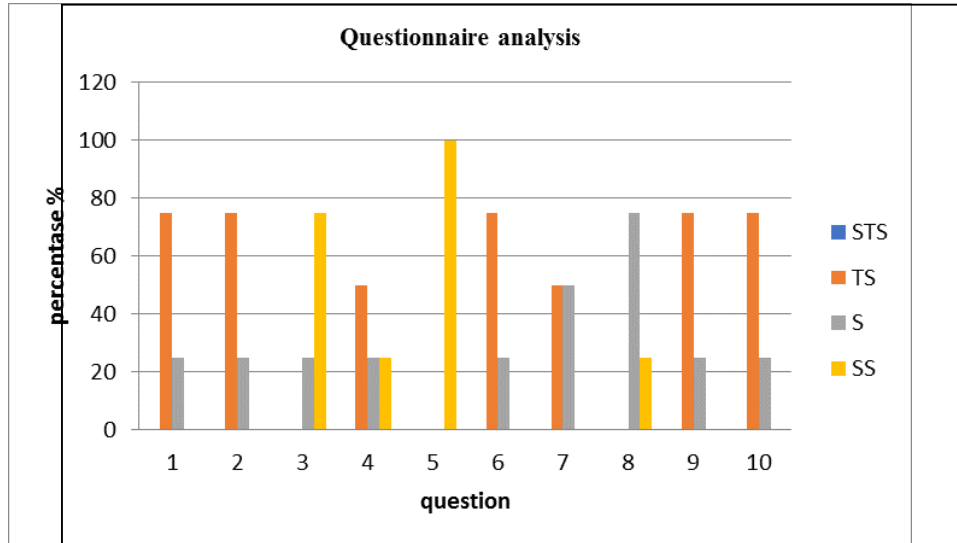


Figure 1. Questionnaire analysis

Table 1 shows the results of an analysis of 10 questions that like to strongly agree, agree; disagree; and strongly disagree. The result of questionnaire analysis is teaching materials used 25% lecturers using representation. Lecturers in explaining lectures are also only 25% using representation. Students are problematic in representing the graph by 75%. Students are easier to use a mathematical representation of 50%. The value of the student still has difficulty in representing the graph. The use of graphical representation is important for science students [7]. Students more easily understand the verbal representation of 75%. Students are easier when the lecturer explains the material using 50% image or graphical representation,

through 75% verbal or mathematical representation. The tasks given by lecturers who use the whole representation are: images, mathematics, verbal, and graphs as much as 25%. The type of exam questions made by lecturers is also only 25% using multiple representation.

B. Data from interview

Interviews for cross-check and compare the questionnaire data that has been collected and observations made. Interviews were conducted to the lecturers of the subjects of basic physics who became the subject of research. Questions raised, and examples of research objectives in Table 2.

Table 2. Interview data

No	Questions	Lecturers' Answers
1.	What is the method / approach / model used in the course? Have you used the multi-representation learning model?	The lectures are still centered on lecturers, not student centered, not yet using the multi-representation learning model
2.	What types of representations are often used by students in solving problems?	Representations that students often use are verbal and mathematical representations
3.	Are students still having difficulties in image and graphic representation? and difficulties in using multiple representations?	Students still have difficulty in solving problems with the representation of images and graphs.
4.	Is the textbook made by lecturers using multi representation?	Textbooks that have not been made in detail explain the concept in a multi-representation.
5.	Is the question instrument created by the lecturer using multi representation?	Problems that are made still require many students to complete with verbal and mathematical representation.

Conclusion

Based on the results of questionnaires, interviews and observations obtained conclusion. Students of Universitas Nahdlatul Ulama Lampung are still having difficulties in using representation to solve the problem. Students are still having difficulty mainly analyzing graphical representation. Lecture model, teaching materials, and instrument questions have not used multi representation.

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